

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method for detecting when a fluid container has emptied during the course of an infusion, comprising:

sampling ~~[[the]]~~ pressure at a selected frequency within an infusion line connecting the ~~[[a]]~~ fluid container with an infusion flow control device at a location of the infusion line between the container and a fluid movement mechanism forming a part of the infusion control device ~~at a selected frequency~~;

calculating a first averaged sampled pressure value by averaging ~~[[the]]~~ sampled pressures ~~sampled pressure over~~ during a first selected period of time;

storing the first averaged sampled pressure value in a memory;

calculating a second averaged sampled pressure value by averaging ~~[[the]]~~ sampled pressures ~~sampled pressure over~~ during a second selected period of time;

calculating a difference between the first averaged sampled pressure value and the second averaged sampled pressure value; and

providing a signal if the difference reaches a pre-determined threshold value indicative of the level of fluid remaining in the container.

2. (Currently Amended) The method of claim 1 further comprising:

continuing to sample the pressure within the infusion line and calculating averaged sampled pressure values, incrementing the selected period of time for each calculation;

comparing ~~[[the]]~~ a latest averaged sample pressure value to a next previous averaged sampled pressure ~~value and value~~;

calculating a difference between the latest averaged sample pressure value and the next previous averaged sampled pressure value; and

providing the ~~[[a]]~~ signal indicative of the level of fluid remaining in the container if the difference reaches ~~[[a]]~~ the pre-determined threshold value.

3. (Currently Amended) The method of claim 2 further comprising:

processing multiple averaged sample pressure values to provide an ~~an optimized~~ a measure of a rate of change ~~of a slope~~ of the multiple averaged sample pressure values, and

determining when the ~~optimized~~ measure of the rate of change indicates the existence of a pre-defined condition within the infusion line.

4. (Currently Amended) The method of claim 1 wherein providing the signal indicative of the level of fluid remaining in the container provides an indication that the container is empty.

5. (Currently Amended) The method of claim 2 wherein providing the signal indicative of the level of fluid remaining in the container provides an indication that more than one ~~a drip chamber associated with the~~ container is empty.

6. (Currently Amended) The method of claim 1 further comprising the step of synchronizing the sampling with movement of ~~a pump~~ the fluid movement mechanism that causes the fluid to flow from the fluid container.

7. (Canceled)

8. (Currently Amended) The method of claim 1 further comprising the steps of sampling the pressure within an infusion line connecting a primary and a secondary fluid container with a ~~fluid~~ the fluid movement mechanism flow control device and based on the steps of calculating averaged sampled pressure values, storing averaged sampled pressure values, and calculating a difference, providing a first signal if the difference reaches a first threshold indicating that the secondary is empty, and providing a second signal if the difference reaches a second threshold indicating that the primary is empty.

9. (Currently Amended) A system for determining when a fluid container connected to an infusion ~~pump having a pumping mechanism flow control device~~ by an infusion line has been emptied of fluid, the system comprising:

a pressure sensor in operable communication with the fluid line and disposed at a location between the container and the pumping mechanism, the pressure sensor capable of monitoring a pressure within the fluid line and providing signals ~~a signal~~ representative of pressure related values of the monitored pressure; [[and]]

a memory adapted to store the ~~for storing~~ pressure related values; and

a processor in operable communication with the pressure sensor and the memory, the processor programmed to receive signals from the pressure sensor and sample the received signals at selected intervals, the processor also programmed to calculate a first averaged sampled pressure value from ~~[[the]]~~ signals received during a first selected interval and store the first averaged sampled pressure value in the memory, the processor also programmed to compare the stored first averaged sampled pressure value with a second averaged sampled pressure value calculated from signals received during a second selected interval and provide a container empty signal if the comparison results in a difference between the first and second calculated averaged sampled pressure values reaches a predetermined threshold.

10. (Currently Amended) The system of claim 9 wherein the pressure sensor is located within a housing of the infusion pump ~~flow control device~~.

11. (Currently Amended) The system of claim 9 wherein the processor is remote from the infusion pump ~~flow control device~~.

12. (Currently Amended) The system of claim 9 wherein the processor is in communication with an information system of an institution, and wherein the container empty signal is communicated to the information system for dissemination to at least one care giver within the institution.

13. (Original) The system of claim 9 wherein the processor is programmed to count a ~~[[the]]~~ number of revolutions of the pumping mechanism ~~a fluid movement mechanism of the infusion flow control device~~, and to calculate ~~calculates~~ the averaged pressure value when a predetermined number of revolutions have been completed.

14. (Currently Amended) The system of claim 9 wherein the pressure sensor is disposed in direct contact with the fluid line ~~at a location between a fluid movement mechanism of the infusion flow control device and the container~~.

15. (Currently Amended) The system of claim 9 wherein the processor is configured to sample the received signals in synchronization with movement of ~~[[a]]~~ the pumping mechanism ~~fluid control mechanism forming part of the infusion flow control device~~.

16. (Currently Amended) The system of claim 9 wherein the processor is further configured to sample the pressure within ~~[[the]]~~ an infusion line that connects a primary and a secondary fluid container with the pumping mechanism ~~infusion flow control device~~.

17. (Currently Amended) The system of claim 16 ~~[[9]]~~ wherein the processor is configured to indicate the secondary is empty when the comparison results in a difference reaching a first threshold and to indicate the primary is empty when the comparison results in a difference reaching a second threshold ~~infusion flow control device comprises an infusion pump~~.